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| 44 | PROCESS | 79 | .By treated material sampling means |
| 45 | .Plugging or tapping | 80 | .With analyzer or computation means |
| 46 | .Cooling | 81 | .With means supplying a treating agent |
| 47 | .Tuyere operation | 82 | ..Correlated flow of diverse fluents |
| 48 | MEANS FOR CUTTING SOLID METAL WITH HEAT, E.G., BLOWPIPES | 83 | ...With flow rate sensor |
| 49 | .With waste entrapping fluid | 84 | ...With means sensing moisture content |
| 50 | .Means for cutting continuously cast workpieces | 85 | ..Individual control of diverse inputs |
| 51 | .Means for removing surface material, e.g., scarfing | 86 | ..By means positioning dispenser |
| 52 | ..Having means to simultaneously scarf multiple sides of a workpiece | 87 | .With temperature sensor |
| 53 | ..Having workpiece-contacting cutting means spacer | 88 | ..In a fluid |
| 54 | .With means for cutting tubular workpiece | 89 | .With pressure sensor |
| 55 | ..Having torch mount secured within workpiece | 90 | .With means responsive to condition of treated material |
| 56 | ..Having means to circumrotate torch about workpiece | 91 | ..By means sensing weight or density of work |
| 57 | ..With means to rotate workpiece | 92 | ..By means sensing position of work |
| 58 | .With pattern control means | 93 | ...By means sensing presence or absence of work |
| 59 | ..With tape-control means | 94 | ...By means sensing level of molten liquid |
| 60 | ..With automatic line-follower means | 95 |By float means |
| 61 | ..With means to rotate workpiece | 96 | WITH PROGRAMMED, CYCLIC, OR TIME RESPONSIVE CONTROL MEANS |
| 62 | ..Having articulated arm supporting torch | 97 | .By timer |
| 63 | ...With pantograph arm means | 98 | ..Having driven disk or drum |
| 64 | ..Having spaced, superposed templet | 99 | WITH RECORDING, INDICATING, INSPECTION OR MEASURING MEANS |
| 65 | .With work supporting grate means | 100 | .Having observation means |
| 66 | .Hand held, work riding torch | 101 | HAVING MEANS FOR LEACHING AND SUBSEQUENTLY PRECIPITATING A METAL |
| 67 | .With wheeled carriage torch mount | 102 | MEANS TREATING A CONTINUUM OF WORK |
| 68 | ..Having work contacting torch spacing means | 103 | .With heating means |
| 69 | ..With work-spanning torch mount | 104 | ..By joule effect |
| 70 | .Circle cutter | 105 | ..Discrete article continuum |
| 71 | .Having torch solely supported by workpiece | 106 | ..Overlapped planar coil |
| 72 | .With cantilevered arm torch support | 107 | ..In a molten material bath |
| 73 | ..Having carriage-supported cantilevered arm | 108 | ..In a muffle furnace |
| 74 | .Having adjuvant material feed | 109 | ..With cooling by contact with solid heat sink |
| 75 | ..Solid material | 110 | ..In specific environment, e.g., vacuum |
| 76 | .Having torch spacing means | 111 | ..With fluid contact means |
| 77 | .With torch mounting means | 112 | ...In liquid bath |
| 78 | WITH CONTROL MEANS RESPONSIVE TO SENSED CONDITION | 113 | ...In liquid spray |

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| 114 | HAVING MEANS FOR CONTACTING A SOLID METALLIFEROUS MATERIAL OR METAL OBJECT WITH A LIQUID | 142 | GEOGRAPHIC OR STRUCTURAL INSTALLATION |
| 115 | .With means changing the shape of a treated object, e.g., roller means | 143 | .Having refining vessel with travelling support |
| 116 | ..Spring shaping means | 144 | WITH MEANS TREATING OR HANDLING GASES EXHAUSTED BY TREATING MEANS |
| 117 | .With means to prevent warping of treated object | 145 | .Having means to treat or handle gases evolving from rotary furnace |
| 118 | ..Of a gear wheel | 146 | .By contacting gas with nonmetallic liquid |
| 119 | ..With heating of object | 147 | ..By liquid spraying |
| 120 | .By immersing an article to be treated in bath of molten material, e.g., salt bath | 148 | .By condensing and collecting a volatile constituent |
| 121 | .With heating means, e.g., flame contact | 149 | ..Within evacuated chamber |
| 122 | ..By means treating metalliferous materials, e.g., ores | 150 | ..Having molten metal splashing means |
| 123 | ..By heating means adapted to be inserted into a hollow object | 151 | ..By cascading material evolving the gas |
| 124 | ..By means heating selected areas of an object | 152 | ..By indirect liquid heat exchange means |
| 125 | ...By means specialized to heat an article having an irregular contour (e.g., cams, gears) | 153 | ..Having retort condenser |
| 126 |By heating means configured to fit between adjacent gear teeth | 154 | ..Vertical shaft furnace |
| 127 | ..Unitized heating and fluid contact means | 155 | .With heat exchanger, e.g., waste heat boiler |
| 128 | ..By electric heating means | 156 | .By means recycling exhaust gas |
| 129 | ...Inductance type | 157 | .By separating particles from evolved gas |
| 130 | ..Having bath for contacting the work with liquid | 158 | .Hood |
| 131 | ...With means to agitate or control temperature of bath | 159 | .Offtake |
| 132 | ...Having work introducing elevator | 160 | COMBINED OR CONVERTIBLE |
| 133 | ...Having means to move work through bath | 161 | MEANS FOR EXTRACTING AND REFINING METAL |
| 134 | .By means contacting only selected areas of treated article with liquid | 162 | .With separate refining zone |
| 135 | WITH CLEANING OR LUBRICATING MEANS | 163 | ..With rotating heating vessel |
| 136 | .Fluid injector cleaner | 164 | ..With heated vertical extracting means |
| 137 | WITH MEANS TO COMMINUTE OR DISINTEGRATE SOLIDS | 165 | AMBULANT VESSEL |
| 138 | WITH MEANS TO PREHEAT GAS | 166 | TREATING VESSEL WITH DISTINCT MOLTEN MATERIAL HOLDING MEANS, E.G., FOREHEARTH |
| 139 | .Having heat storage means, e.g., checkers, stoves | 167 | THERMIT REACTION VESSEL |
| 140 | .By heat generating means | 168 | MEANS FOR TREATING ORES OR FOR EXTRACTING METALS |
| 141 | .By remote heat exchanger | 169 | .Amalgam-type extraction means |
| | | 170 | .By means precipitating metal from solution |
| | | 171 | .By means applying heat to work, e.g., furnace |
| | | 172 | ..Fluidized zone |
| | | 173 | ..Rotary drum-type furnace |
| | | 174 | ..With safety device |

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| 175 | ..With separate preheat chamber | 209 | ...By upward flow of metal within treating zone |
| 176 | ..With means for moving solid material to or through heating zone | 210 |Recirculating material to its source |
| 177 | ...By means for moving charge through zone | 211 | ...Enclosed within casing |
| 178 |Traveling grate | 212 | .Refining means with separate metal-melting zone |
| 179 |With seal means | 213 | .Revolving drum-type furnace |
| 180 |Train of grate elements | 214 | .Reverberatory refining vessel, e.g., open hearth |
| 181 |Means forming cascading array | 215 | .Continuous refining |
| 182 | ...By fluid current | 216 | .By means introducing treating material |
| 183 | ...By power-driven means conveying solid charge into zone | 217 | ..Gaseous treating material |
| 184 | ...Bell and hopper type | 218 | ...Having fluid inlet formed in vessel wall, e.g., tuyere |
| 185 | ..With work supporting grate | 219 |Having intersecting streams converging on central axis of vertical furnace |
| 186 | ..With means for feeding fluids | 220 |Having porous outlet |
| 187 | ...With flow regulating means | 221 |By means to introduce diverse material |
| 188 | ...With common outlet means to feed diverse fluids | 222 |Concentric flow paths |
| 189 | ...With means to cool fluid feeding means | 223 |Having control means |
| 190 | ..With cooling of heating means | 224 |Having tuyere formed in plug bottom |
| 191 | ...By means cooling material discharge means | 225 | ...Lance |
| 192 | ...By direct fluid contact | 226 |With manipulating means |
| 193 | ...By means embedded in heating means | 227 | .By separating metal in a molten mass from undesired material, e.g., slag |
| 194 |Having means to facilitate removal of cooling means | 228 | ..By skimming a material |
| 195 | ..With discharge means | 229 | ..By baffle means |
| 196 | ...With trough-shaped outlet, e.g., runner | 230 | ...At discharge outlet |
| 197 | ..Shaft-type furnace, e.g., blast furnace | 231 | ...In discharge trough, e.g., runner |
| 198 | ...Having external support | 232 | ..Settling receptacle, e.g., slag pot |
| 199 | ...Having specific top structure | 233 | .By stirring or mixing molten metal |
| 200 | MEANS FOR MELTING OR VAPORIZING METAL OR TREATING LIQUEFIED METAL | 234 | ..Induction stirring |
| 201 | .Slag refining means | 235 | ..Having impeller means |
| 202 | .Spray refining means | 236 | .With means to discharge molten material |
| 203 | .By means specialized to puddle metal | 237 | ..Including electromagnetic means |
| 204 | .Means applying centrifugal force | 238 | ..Means for removing residual material |
| 205 | .Means to melt and separate metal from mass of diverse constituents | 239 | ..By changing ambient pressure on material surface, e.g., suction |
| 206 | .Means for melting-type material, e.g., Linotype | 240 | ..With means to tilt heating means |
| 207 | .By providing, treating or protecting environment, e.g., vacuum | 241 | .With means to cool treating means |
| 208 | ..By application of vacuum | 242 | .Heated melting pot |

243 .Bessemer-type treating vessel
 244 ..By mounting vessel to revolve about its longitudinal axis
 245 ..With means pivotally mounting vessel
 246 ...Means mounting vessel to trunnion ring
 247 ...Means mounting vessel to U-shaped trunnion support means
 248 .Horizontal, rotatable, cylindrical type
 249 **MEANS TREATING SOLID METAL**
 250 .Having evacuated chamber
 251 .By contact with gas
 252 ..With heating means
 253 ...Bottom feeding furnace
 254 ...With indirect heat-exchange means for gas
 255 ...Having work contained in separate, noncommunicating chamber, e.g., muffle
 256Bell furnace
 257 ...Having atmosphere generating means within treating zone
 258 ..By contacting only selected areas of object
 259 .By cooling of the solid
 260 ..By contact with solid heat sink
 261 .By flame contact heating
 262 .Fluid tight heat transferring box shield or hood (e.g., annealing box)
 263 ..Bell-type hood, or support for such hood
 264 ...Having packing at hood lip
 265 **MEANS FOR INTRODUCING FLUENT INTO VESSEL, E.G., TUYERE**
 266 .With flow control means or internal flow guide
 267 .Having means for simultaneously feeding diverse materials
 268 ..Having plural outlets
 269 .Having drain means or cleaner insertion means, e.g., punch hole
 270 .Having means preventing damage to introducing means, e.g., wear linings, cooling
 271 **MEANS SEALING OR OPENING APERTURE IN VESSEL**
 272 .By means plugging aperture
 273 ..By means injecting plugging compound, e.g., mud gun
 274 **MEANS FOR HOLDING OR SUPPORTING WORK**

275 .Receptacle
 276 ..With means movably supporting receptacle
 277 ...By bed of rollers
 278 ..Having corrugated wall
 279 .Grate
 280 **LININGS**
 281 .With making or repairing means
 282 .With metallic means to prevent lining abrasion
 283 .Having particular lining element shape
 284 .Having specific grain size
 285 .With means allowing for expansion
 286 .With specific lining enclosing structure
 287 **MISCELLANEOUS**

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